**Practitioner's Docket No.:** 210_187DIV *PATENT*

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re the application of: Neelkanth S. Gupte

Filed: Concurrently Herewith

For: HEAT EXCHANGER FOR HIGH STAGE GENERATOR OF ABSORPTION CHILLER

Mail Stop Patent Application
Commissioner for Patent
P.O. Box 1450
Alexandria, Va 22313-1450

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Christine M. Holmes

**PRELIMINARY AMENDMENT**

Sir:

Prior to examination, Applicant wishes to amend the subject application as follows:

**In the Claims:**

Please cancel claims 1-36 and replace with new claims 37-58 as follows:

--37. In an absorption cooling system of the type which uses a refrigerant and an absorbent solution and which includes a high stage generator, absorber, condenser, heat exchangers, and an evaporator and means for connecting said components to one another to form a closed absorption cooling system with said solution side of said high stage generator being fluidically divided with a partition plate into two sections of substantially identical construction whereby gas exiting one section at relatively high temperature is further cooled in the second section which functions as a flue gas recuperator (FGR) to improve overall burner efficiency, and where the entire solution leaving the absorber is passed through the FGR..

38. In an absorption cooling system of the type which uses a refrigerant and an absorbent solution and which includes a high stage generator, absorber, condenser, heat exchangers, and an evaporator and means for connecting said components to one another to

form a closed absorption cooling system with said solution side of said high stage generator being fluidically divided with a partition plate into two sections of substantially identical construction whereby gas exiting one section at relatively high temperature is further cooled in the second section which functions as a flue gas recuperator (FGR) to improve overall burner efficiency, in which a fraction of the solution leaving the absorber is passed through the FGR..

39. In an absorption cooling system of the type which uses a refrigerant and an absorbent solution and which includes a high stage generator, absorber, condenser, heat exchangers, and an evaporator and means for connecting said components to one another to form a closed absorption cooling system with said solution side of said high stage generator being fluidically divided with a partition plate into two sections of substantially identical construction whereby gas exiting one section at relatively high temperature is further cooled in the second section which functions as a flue gas recuperator (FGR) to improve overall burner efficiency, in which the stream of weak solution leaving H2 is split with a fraction of said solution being heated in the FGR.

40. In an absorption cooling system of the type which uses a refrigerant and an absorbent solution and which includes a high stage generator, absorber, condenser, heat exchangers, and an evaporator and means for connecting said components to one another to form a closed absorption cooling system with said solution side of said high stage generator being fluidically divided with a partition plate into two sections of substantially identical construction whereby gas exiting one section at relatively high temperature is further cooled in the second section which functions as a flue gas recuperator (FGR) to improve overall burner efficiency, in which part of the solution entering G2 is bypassed to the FGR.

41. In an absorption cooling system of the type which uses a refrigerant and an absorbent solution and which includes a high stage generator, absorber, condenser, heat exchangers, and an evaporator and means for connecting said components to one another to form a closed absorption cooling system with said solution side of said high stage generator being fluidically divided with a partition plate into two sections of substantially identical construction whereby gas exiting one section at relatively high temperature is further cooled in the second section which functions as a flue gas recuperator (FGR) to improve overall burner efficiency and where all of the weak solution that is circulated in the absorption cycle is passed through the FGR before entering in low temperature heat exchanger to exchange heat with exhaust gas leaving high stage generator section to eliminate the danger of crystallization of strong solution in the low temperature heat exchanger.

42. In an absorption cooling system of the type which uses a refrigerant and an absorbent solution and which includes a high stage generator, absorber, condenser, heat exchangers, and an evaporator and means for connecting said components to one another to form a closed absorption cooling system with said solution side of said high stage generator being fluidically divided with a partition plate into two sections of substantially identical construction whereby gas exiting one section at relatively high temperature is further cooled in the second section which functions as a flue gas recuperator (FGR) to improve overall burner efficiency, and where a fraction of weak solution that is circulated in the absorption cycle is passed through the FGR to exchange heat with exhaust gas leaving the high stage generator section.

43. The system of claim 42 in which solution leaving the FGR is mixed with heated weak solution leaving the high temperature heat exchanger.

44. The system of claim 43 in which the fraction of solution passing through the FGR is such that temperature of solution leaving FGR is =/-10 degree C when comparted to temperature of heated weak solution leaving the high temperature exchanger.

45. The system of claim 42 in which solution leaving the FGR is mixed with heated weak solution leaving the low temperature heat exchanger.

46. The system of claim 45 in which the fraction of solution passing through the FGR is such that the temperature of solution leaving the FGR is +/-5 degree C when compared to temperature of heated weak solution leaving low temperature heat exchanger.

47. The system in claim 44 in which the fraction of solution flow entering the FGR is determined by use of an orifice.

48. The system in claim 44 in which the fraction of solution flow entering the FGR is determined by use of a mechanical valve.

49. The system in claim 44 in which the fraction of solution flow entering the FGR is determined by use of an electronically controlled valve.

50. The system in claim 46 in which the fraction of solution flow entering the FGR is determined by use of a mechanical valve.

51. The system in claim 46 in which the fraction of solution flow entering the FGR is determined by use of a mechanical valve.

52. The system in claim 46 in which the fraction of solution flow entering the FGR is determined by use of an electronically controlled valve.

53. In an absorption cooling system of the type which uses a refrigerant and an absorbent solution and which includes a high stage generator, absorber, condenser, high and low temperature heat exchangers, and an evaporator and means for connecting said components to one another to form a closed absorption cooling system with said solution side

of said high stage generator being fluidically divided with a partition plate into two sections of substantially identical construction whereby gas exiting one section at relatively high temperature is further cooled in the second section which functions as a flue gas recuperator (FGR) to improve overall burner efficiency, and where a fraction of the stream of the weak solution leaving the low temperature heat exchanger is passed through the FGR to exchange heat with exhaust gas leaving the high stage generator section.

54. In an absorption cooling system of the type which uses a refrigerant and an absorbent solution and which includes a high stage generator, absorber, condenser, high and low temperature heat exchangers, and an evaporator and means for connecting said components to one another to form a closed absorption cooling system with said solution side of said high stage generator being fluidically divided with a partition plate into two sections of substantially identical construction whereby gas exiting one section at relatively high temperature is further cooled in the second section which functions as a flue gas recuperator (FGR) to improve overall burner efficiency, and where the fraction of solution passing through the FGR is such that the temperature of the solution leaving the FGR is +/-5 degree C when compared to the temperature of the heated weak solution leaving the high temperature heat exchanger.

55. In an absorption cooling system of the type which uses a refrigerant and an absorbent solution and which includes a high stage generator, absorber, condenser, high and low temperature heat exchangers, and an evaporator and means for connecting said components to one another to form a closed absorption cooling system with said solution side of said high stage generator being fluidically divided with a partition plate into two sections of substantially identical construction whereby gas exiting one section at relatively high temperature is further cooled in the second section which functions as a flue gas recuperator

(FGR) to improve overall burner efficiency and where a fraction of the solution entering the low stage generator is bypassed to exchange heat in the FGR to produce refrigerant vapor.

56. The system in claim 55 in which the fraction of the solution entering FGR is such that concentration of solution leaving FGR is equal to concentration of solution leaving low stage generator.

57. The system in claim 55 in which the fraction of solution entering the FGR is such that the absorbent concentration of solution leaving the FGR is within +/0.5 percent absolute when compared to the absorbent concentration of solution leaving the low stage generator.

58. The system of claim 55 in which the vapor portion of the FGR and vapor portion of the low stage generator are fluidically connected to operate at a pressure difference not exceeding 0.2 torr.

**REMARKS**

The above submitted new claims were necessary in that originally nonelected claims 2-5 and 9-20 were dependent upon previously allowed independent claim 1. Similarly, nonelected claims 22-27 were dependent upon previously allowed independent claim 21. Newly drafted claims 37-58, in substance, cover the invention recited in previously nonelected, claims 2-5, 9-20 and 22-27.

If the Examiner believes that contact with applicant's attorney would be advantageous toward the disposition of this case, he is herein requested to call applicant's attorney at the phone number noted below.

The Commissioner is hereby authorized to charge any additional fees associated with this communication or credit any overpayment to Deposit Account No. 50-0289.

Respectfully submitted,

WALL MARJAMA & BILINSKI LLP

June 24, 2003
Date

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